



Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

AWARD-WINNING POLYMER PHYSICIST SELECTED TO ATTEND LEADING ENGINEERS SYMPOSIUM



The National Academy of Engineering's (NAE) Symposium introduces the nation's top young engineers to each other, challenges them to think about developments and problems at the frontiers of areas different from their own, and facilitates collaborative work and the transfer of new techniques and approaches across various fields. The program also helps establish contacts among the next generation of leaders in engineering.

Dr. Timothy J. Bunning, an award-winning polymer physicist with the Materials and Manufacturing Directorate, contributes to the collective knowledge of the directorate. His appointment enhances AFRL's reputation as a world leader in materials research and development and highlights the talent, dedication, and professionalism of the men and women who work there.



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Accomplishment

Dr. Bunning was one of 80 leading young engineers in the United States selected to attend the NAE's 8th Annual Frontiers of Engineering Symposium at the academy's Arnold and Mabel Beckman Center in Irvine, California. This 3-day symposium covered a wide range of topics including chemical engineering, human factors engineering, nuclear energy, and quantum information technology.

The symposium brought together engineers ages 30 to 45, who are performing leading-edge engineering research and technical work. Fellow engineers or organizations nominated participants from industry, academia, and government.

Background

Dr. Bunning, recognized internationally for significant contributions in a variety of polymer-based optical materials areas, conducts research in polymer-dispersed liquid crystals, polymeric side-chain liquid crystals, laser-resistant polymers, and active and passive polymer photonic structures. A primary focal point of his research is increasing understanding of the very complex nature of nanoscale structure development in holographic polymer-dispersed liquid crystals—polymer-based optical elements that have broad-based applications' potential in a number of topical areas such as display and telecommunications technology.

Working with his colleagues in the directorate's Survivability and Sensor Materials Division, Dr. Bunning successfully demonstrated the one-step fabrication of electrically switchable reflection and transmission holograms using holographic photopolymerization. His research efforts increased the understanding of the complex, dynamic balance between polymerization kinetics, diffusion, and phase separation using high-resolution electron microscopy techniques and real-time X-ray and light-scattering measurements. His efforts help advance the development of comprehensive structure/property relationships for a relatively new class of materials.

Dr. Bunning is a recipient of the 2001 Federal Laboratory Consortium Award for Excellence in Technology Transfer and the John H. Dillon Medal, presented each year by the 40,000-member American Physical Society for outstanding contributions to science and national security. He leads a research and development effort aimed at developing new responsive materials and approaches for optical sensing, laser beam control, and filtering applications. The research he performs directly supports the Air Force and the Department of Defense and, in some instances, benefits commercial industry.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-ML-18)

Materials and Manufacturing
Awards/Recognition